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FOREST STATISTICS FOR CHELAN COUNTY, WASHINGTON FROM THE INVENTORY PHASE OF THE FOREST SURVEY

By W.H. Bolles

CALIFORNIA FOREST & RANGE EXPERIMENT STATION
330 GIANNINI HALL, UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

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Forest Survey

June 8, 1936

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California Forest & Range Exp. Station,
332 Giannini Hall,
Berkeley, Calif.

Dear Sir:

Enclosed is a copy of "Forest Statistics for Chelan County, Washington". This is the eighth of the Forest Survey reports for counties in eastern Oregon and eastern Washington and is similar to those already sent you. The explanatory text which accompanied the first report should be referred to in connection with this and other reports for counties in eastern Oregon and eastern Washington.

Forest statistics published to date include those for all counties in western Oregon and western Washington, Klamath, Wasco, Jefferson, Harney, and Deschutes Counties in eastern Oregon, and Yakima and Klickitat Counties in eastern Washington. Additional copies of these reports will be furnished upon request.

Very truly yours,

THORNTON T. MUNGER, Director

By H. J. Andrews
Acting

Enclosure

CALIFORNIA FOREST & RANGE EXPERIMENT STATION
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FOREST STATISTICS
FOR
CHELAN COUNTY, WASHINGTON

FROM THE INVENTORY PHASE OF THE FOREST SURVEY

[Forest survey report no. 58]

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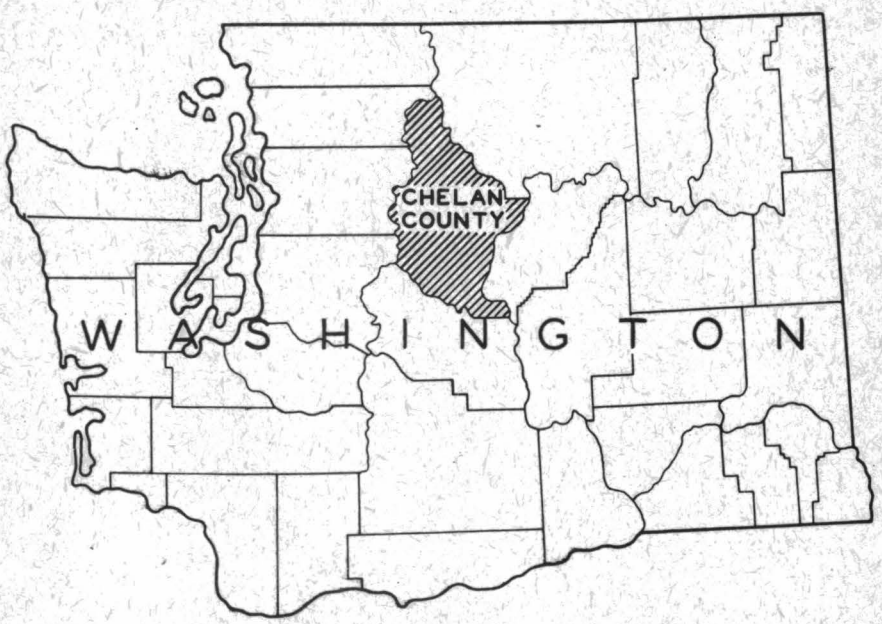

U. S. DEPARTMENT OF AGRICULTURE FOREST SERVICE
PACIFIC NORTHWEST FOREST EXPERIMENT STATION
THORNTON T. MUNGER, DIRECTOR

H. J. ANDREWS, IN CHARGE OF FOREST SURVEY R. W. COWLIN, ASSISTANT

W. H. BOLLES, IN CHARGE OF FIELD AND OFFICE WORK
IN CHELAN COUNTY

PORTLAND, OREGON MAY 25, 1936

CALIFORNIA FOREST & RANGE EXPERIMENT STATION
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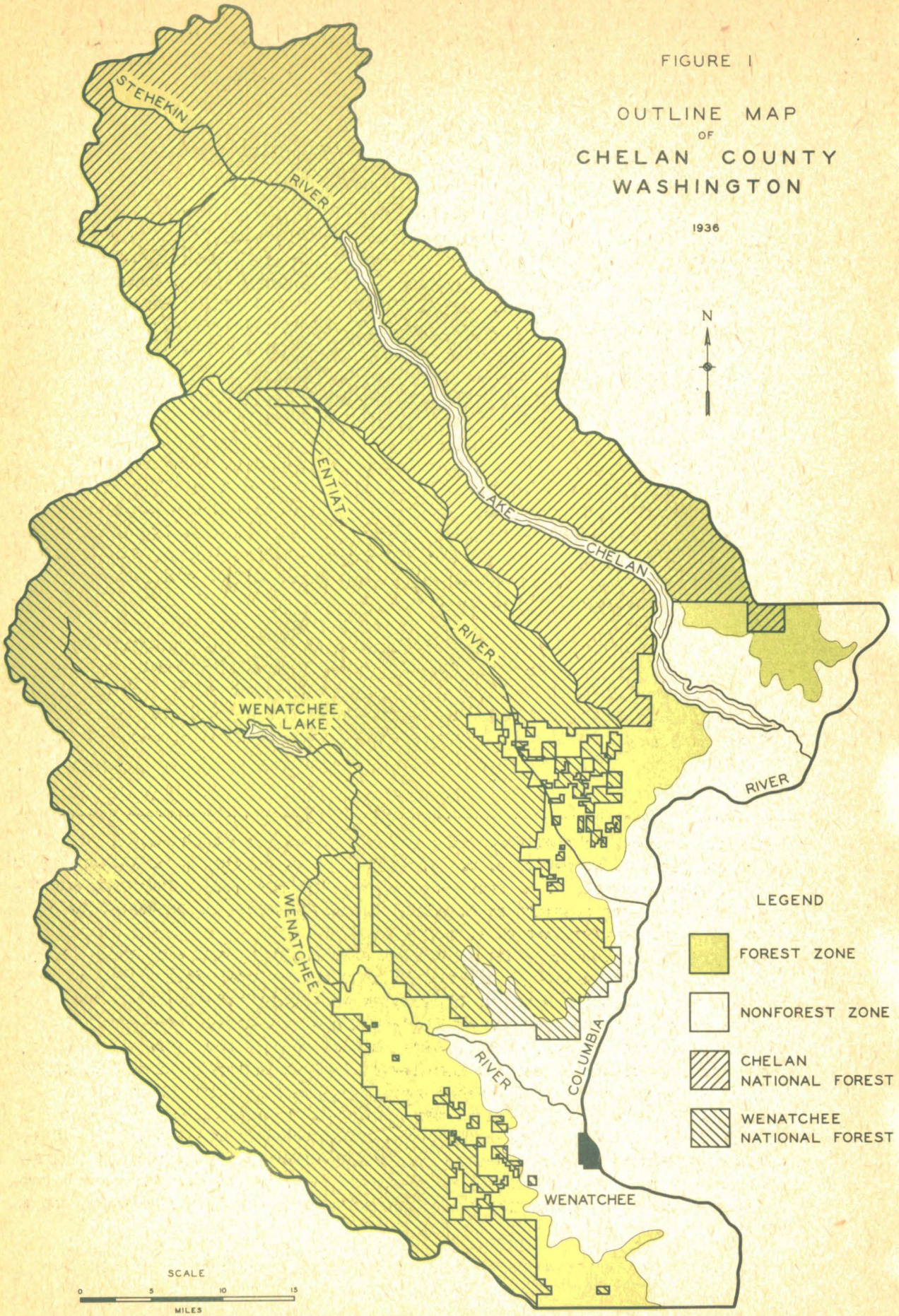
FIGURE 1

OUTLINE MAP OF CHELAN COUNTY WASHINGTON

1936



FOREST STATISTICS FOR CHELAN COUNTY, WASHINGTON

By W. H. Bolles[1/]

This is the initial report of a forest survey of Chelan County, Washington,[2/] which was conducted during 1934-35 by the Forest Service as part of a national survey of forest resources. The statistics of the forest inventory of Chelan County are presented in four tables and four figures. An explanatory text, "The Forest Survey of Eastern Oregon and Eastern Washington", outlining the procedure followed in the survey and a definition of the types used should be read in connection with this report.

Location and Description of the County

Chelan County, in north-central Washington, lies between the Cascade Divide and the Columbia River. It is bounded on the north by a high ridge which separates the Methow River drainage from those streams tributary to Lake Chelan and on the south by Wenatchee Ridge, a mountain range between the Wenatchee and Yakima Rivers. This county is slightly less than 90 miles long, averages about 45 miles wide, and has a land area of approximately 1,856,000 acres.

The topography is mountainous and much of it is extremely rugged. In the western part of the county along the Cascade Range are a number of glacier peaks, while a considerable part of the area is at such a high elevation and so rocky that it will not sustain commercial forests. Along the Columbia River in the extreme eastern part of the

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1/ THE FIELD WORK OF THE FOREST SURVEY OF CHELAN COUNTY WAS DONE BY W. H. BOLLES, P. A. BRIEGLEB, P. N. PRATT, W. V. LITCHFIELD, G. N. ALLMAN, G. H. JACKSON, R. W. COX, L. W. HUNTINGTON, R. H. EDDY, GEO. FROST, FENTON HARLESS, AND N. R. EDMONDSON. THE DATA WERE COMPILED BY W. H. BOLLES, W. E. PELTO, C. DE WOLFE, C. H. SIGGLIN, B. P. BENNETT, AND C. E. BROWN.

2/ OREGON AND WASHINGTON WERE DIVIDED FOR PURPOSES OF THE SURVEY INTO TWO REGIONS, (1) THE DOUGLAS FIR REGION, CONSISTING OF THAT PART OF BOTH STATES WEST OF THE SUMMIT OF THE CASCADE RANGE, AND (2) EASTERN OREGON AND EASTERN WASHINGTON, THAT PART OF BOTH STATES EAST OF THE SUMMIT OF THE CASCADE RANGE. EACH REGION WAS DIVIDED INTO FOREST SURVEY UNITS COMPOSED OF ONE OR MORE COUNTIES. AT A LATER DATE A REPORT WILL BE ISSUED FOR EACH SURVEY UNIT PRESENTING A TEXTUAL DESCRIPTION OF THE UNIT, DETAILED INVENTORY SUMMARIES, AND STATISTICS OF GROWTH AND DEPLETION ANALYZED IN THE LIGHT OF THE INVENTORY. FINALLY, A REGIONAL REPORT WILL BE ISSUED WHICH WILL SUMMARIZE THE UNIT REPORTS, PRESENTING AND DISCUSSING FINDINGS FOR THE REGION AS A WHOLE. THE REGIONAL REPORT WILL INCLUDE AN INTERPRETATION OF THE FOREST SURVEY DATA AS RELATED TO OTHER ECONOMIC DATA AND A COMPREHENSIVE ANALYSIS OF THE REGIONAL FOREST SITUATION FROM BOTH A PHYSICAL AND AN ECONOMIC STANDPOINT.

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county, the topography is less rugged, although even here but little of the area is of moderate topography. Elevations within the county range from approximately 550 feet on the Columbia River to 9,500 feet at the summit of Bonanza Peak.

Climatic conditions vary greatly within the county. The relatively low eastern part is dry as evidenced by an average annual precipitation at Wenatchee of 8.83 inches for the past 23 years. The precipitation is greater in the mountains in the western part of the county and ranges from about 20 to 50 inches depending upon the location and elevation. Along the Columbia River, the growing season is from April to November while in the mountains killing frosts occur during every month in the year.

The prevailing direction of drainage is eastward towards the Columbia River. The principal streams within the county are the Wenatchee River, the Entiat River, and the Stehekin River, all of which are tributary to the Columbia River. Lake Chelan, which is approximately 50 miles long, a mile wide, and with a measured depth of 1,489 feet at one point, resembles a river in many ways and is unique among the water bodies of the world. During the growing season, a great deal of water from all these streams is used for irrigation.

Transportation facilities are varied. The main line of the Great Northern railroad between Seattle and Spokane traverses the county when crossing the Cascade Range, while a spur from Wenatchee north to Oroville follows the Columbia River through the eastern part of the county. Besides numerous dirt roads, there is a considerable mileage of improved roads, including links of the state highway, one going through Stevens Pass and another going north along the Columbia River. A boat line operates on Lake Chelan and in the earlier days boat lines operated on the Columbia River. Each of the larger towns maintains an airport.

According to the Bureau of the Census Chelan County had a population of 31,634 in 1930 which was an increase of 51.3 percent since 1920. The city of Wenatchee has a population of 11,627 and is the principal business and industrial center. Other towns having a population of over 500 are Cashmere, Leavenworth, and Chelan.

Agriculture and Other Land Uses

The forest survey classified as nonforest land, 363,570 acres (table 4), which is slightly less than 20 percent of the county. This includes the glacier and barren areas in the mountains and the relatively narrow belt of open country along the Wenatchee and Columbia Rivers. The majority of the agricultural lands lie along the Columbia River on the eastern margin of the county. The Bureau of the Census for January 1, 1935, showed a total farm area of 177,743 acres, of which 50,082 acres were available for crops. The area of crop land is influenced to a very large degree by the amount of water available for irrigation, although not entirely for there is some dry farming.

The Wenatchee Valley is a well known fruit growing center and in 1929 had 24,634 acres in orchard fruits of which apples are the principal crop. The value of all crops produced in that year was $12,151,135 and nearly 98 percent of this was fruit crops. There are only two counties in the state which exceed it in the total value of crops produced and only Yakima exceeds it in the production of fruit.

The striking feature about agriculture in Chelan County is the high value of crops produced per acre. More than 30,000 people are dependent to a large degree upon a tillable area of about 50,000 acres. Only a small number of persons are engaged in industries or occupations not dependent upon agriculture. Less than 25,000 acres (orchard acreage) produces 98 percent of the total crop value. Consequently, an acre of orchard land supports approximately one person.

The Forests

This is essentially a forested county and standing timber is one of the important natural resources. The forest land of Chelan County totals 1,492,430 acres, or 80.4 percent of the total area (table 4). It is unlikely that the present forest area will ever be materially altered. The location of the forest zone is shown in figure 1.3/

The forest in the eastern and south-central part of this zone is largely ponderosa pine, and these stands occupy from a fourth to a fifth of the forest zone. Along the Entiat and Wenatchee Rivers the pine stands extend into the central part of the county and in the vicinity of Lake Wenatchee are better than the average in quality. The remainder of the county's forest area embracing the more rugged portions of the Cascade Range, consists chiefly of such noncommercial types as lodgepole pine, subalpine forest, and noncommercial rocky areas. The commercial types in this area are represented by Douglas fir, fir-mountain hemlock, and upper-slope mixture which occur as strips along most of the larger streams and frequently attain a width of over a mile. There is relatively little commercial timber of any kind in the northern third of the county. In this county an unusually large proportion, approximately 48 percent, of the forest land is of low value and noncommercial from a timber standpoint.

3/ MAPS ON INCH-TO-THE-MILE SCALE SHOWING THE LOCATION OF THE INTEGRAL AREAS COMPOSING THE 29 TYPES RECOGNIZED IN CHELAN COUNTY WERE PREPARED IN CONNECTION WITH THE FOREST INVENTORY. THIS INFORMATION HAS ALSO BEEN INCORPORATED IN A LITHOGRAPHED MAP, SCALE ¼ INCH TO THE MILE, OF THE NORTHEAST QUARTER AND THE NORTHWEST QUARTER OF WASHINGTON. COPIES OF THESE MAPS MAY BE PROCURED FROM THE PACIFIC NORTHWEST FOREST EXPERIMENT STATION.

Forest Ownership

The forest survey recognizes 12 ownership classes, of which 8 were found in Chelan County. The ownership of forest lands is shown diagrammatically in figure 3. The national forest ownership class is the largest and contains 1,060,625 acres or 71.1 percent of all the forested area. Slightly over half of the national forest lands are of low quality, consisting of lodgepole pine stands, subalpine forests, and noncommercial rocky areas. The other ownership classes are private, railroad selection pending, national forest reserved, State, other Federal, county, and Indian.

Forest Types

A total of 28 forest cover types occupying an area of 1,492,430 acres were mapped in Chelan County. Data on forest type areas, together with data on areas of nonforest land (types 1 and 2) where these were within the forest zone, are presented in tables 2 and 3 and figure 4. The location and distribution of the various forest cover types can best be determined by study of the inch-to-the-mile forest survey type map of the county. The forest zone is divided into two parts, (1) the ponderosa pine types, and (2) the other forest types. The latter is by far the larger, yet the ponderosa pine types are the most important from an economic standpoint.

A. Saw-Timber Types

The forest types (other than lodgepole pine) which contain trees of saw-timber size, i.e., trees 12 inches and larger in d.b.h., have an aggregate area of 613,045 acres, or 41.1 percent of the total forest land in the county. Many of the stands are immature and it will be years before they are ripe for cutting; nevertheless, such stands contain a considerable volume of low grade saw timber at the present time. Further, some of these stands have been selectively logged, leaving a remaining volume of one thousand board feet per acre. The saw timber types fall into two groups, ponderosa pine and other species (table 3).

The ponderosa pine types constitute 427,075 acres, or nearly seventy percent of all the saw-timber types. It includes 34,050 acres of pine woodland (type $5\frac{1}{5}$), which is a mature type but because of the low volume per acre (generally less than 1,000 board feet) has little commercial importance. Pure ponderosa pine (type 20.5) is the largest and most important commercial forest type in the county and occupies 174,740 acres. This type has a comparatively high stumpage value and for the most part occurs in relatively accessible locations. The volume per acre varies considerably, but most of these stands have an average volume of from 3,000 to 7,000 board feet per acre. In the main, they are of fair quality for the northern Cascade Range and relatively sound. The forests containing 50 to 80 percent of mature ponderosa pine (type 20) are similar to the pure pine type, except that they contain a somewhat greater percentage of other species.

The pine mixture (type 27) occurs in the upper altitudinal limits of the ponderosa pine zone. The majority of the volume consists of other species, principally Douglas fir, western larch, and lowland white fir; however, these stands also contain a considerable volume of ponderosa pine, hence are included in the pine group.

Type 21 is a young stand of ponderosa pine, commonly known as "bull pine". There are 128,800 acres of this type, practically all the result of cutting in mature pine forests, but where the stands left after logging exceed 1,000 board feet per acre, generally in small trees unmerchantable at the time of logging.

The Douglas fir forests (types 7, 8, and 9A), together with upper-slope mixture (type 27½) occur near the upper altitudinal limits of ponderosa pine and differ in composition only in the percentage of Douglas fir which is the major species. The associate species are silver fir, western larch, lowland white fir, western white pine, and lodgepole pine. There are 115,620 acres of these types. Some of the Douglas fir stands on the upper reaches of the Wenatchee and Stehekin Rivers are of unusually fine quality for this species when found east of the summit of the Cascade Range, although even these are not to be compared with the better stands in western Washington. The cedar and lowland white fir types (types 17 and 29) aggregate but 2,820 acres and are unimportant.

The fir-mountain hemlock forests (type 23) occur along the upper limits of the commercial timber zone and consist principally of pure stands of mountain hemlock, western hemlock, silver fir, or a mixture of these species. The associate species are Engelmann spruce, western white pine, lodgepole pine and alpine fir. The stands are heavy and volumes of 50,000 board feet per acre are not uncommon; however, the average is considerably lower--20,000 to 30,000 board feet per acre. This type covers 67,530 acres but for the most part is inaccessible and its present value is primarily for watershed protection, game cover, and scenic purposes.

B. Seedling, Sapling, and Pole Types

The commercial timber types less than 12 inches in d.b.h. total 154,730 acres, and like the saw-timber types have been segregated into ponderosa pine and other species (see table 3). The ponderosa pine group, composed of types 22 and 28, is the smaller with an area of 58,755 acres. Approximately 82 percent consists of lands which have been cutover and restocked with ponderosa pine, either pure or in mixture. These lands are very accessible and among those most desirable for forest production in the county.

Conifers less than 12 inches in d.b.h., other than ponderosa and lodgepole pine, occupy 95,975 acres. Practically all of these young stands are found on old burns which have restocked--only 425 acres being cutover land. This indicates that practically all of the cutting in this county to date has been in the pine stands. These im-

mature forests are almost entirely above the altitudinal limits of the ponderosa pine zone, are relatively inaccessible, and of slight economic importance at the present time.

C. Deforested Types

These include the nonrestocked cutover areas and the deforested burns. There are 12,980 acres of these types, practically all of which is deforested burn. The greater part of this is in national forest ownership and practically all of it is mountainous, isolated, and low quality forest land. An overwhelming majority of the logged lands are restocking in a reasonably satisfactory manner.

D. The Noncommercial Forest Types

There are two types classified as noncommercial forest. The largest of these, type 33, consists of subalpine forests which lie above the altitudinal limits of the commercial timber zone. The other, type 38, consists of scattered scrubby stands noncommercial in character, generally due to rocky or sterile site conditions, but within the altitudinal limits of the commercial timber zone. The combined area of these types is 629,050 acres making it the largest of the five type groups. Approximately 84 percent of the noncommercial forest is in national forest ownership.

E. Other Forest Types

Included here are the hardwood types (31 and 31.5) and the lodgepole pine types (25, 26, and 26A). Some of these types are composed of trees over 12 inches in d.b.h., but were not included with the saw-timber types because very little, if any, lumber is obtainable from them. The chief products obtained from these stands are fuel wood and poles. These types aggregate 82,625 acres and 91.2 percent of this is lodgepole pine poles less than 12 inches in d.b.h. The lodgepole pine types are confined to relatively high altitudes, hence are not readily available to the ranchers, who obtain poles for general farm uses. The hardwoods occur along the streams at low elevations and are within or adjacent to the agricultural districts.

Productive Capacity of Forest Land

Table 4 shows a classification of the forest land on the basis of its capacity to produce timber crops. The ponderosa pine zone constitutes approximately 63 percent of the commercial forest land in the county. The average of growing conditions for ponderosa pine for the area classified upon this basis is a poor quality site IV. The average height, in feet, of dominant and codominant trees at 100 years of age for site IV is 79 feet.

The other commercial forest land, using Douglas fir as a basis for classification, has an average of site quality V and the

dominant and codominant trees range from 80 to 90 feet in height at 100 years of age.

Drought and Insects

During recent years a considerable volume of timber on some of the poorer sites near the lower limits of the ponderosa pine zone has died. The severe drought, coupled with insect attacks is believed to be responsible. These losses were largest on the Entiat River and around Lake Chelan, where in some places the greater part of the stand was killed. The mortality reached a zenith in 1931-32 and has now receded to about the normal loss.

Volume of Merchantable Timber

The total volume of merchantable timber, trees 12 inches and larger in d.b.h., in Chelan County is 5,285,550 M board feet. The distribution of this volume by species is shown in table 1 and figure 2. Ponderosa pine is the most valuable species and comprises a third of the total volume, followed by Douglas fir with nearly a quarter and silver fir with nearly a sixth. These three species form approximately 73 percent of the total volume. A portion of the national forest timber, equivalent to 6.5 percent of all the timber in the county, has been reserved from cutting.

Over 70 percent of the stumpage is in national forest ownership while approximately 18 percent is private. The national forests have about 55 percent of the ponderosa pine, over 73 percent of the Douglas fir, and over 83 percent of the silver fir. Over 35 percent of the ponderosa pine, which species constitutes nearly two-thirds of all the private timber, is privately owned.

The hardwood species are of minor importance in this county. Northern black cottonwood and aspen are found along the streams and have a total volume of 20,786 M board feet.

Forest Industries

Logging

Logging operations are confined largely to the ponderosa pine types, although there is some cutting in the better quality Douglas fir stands along the Stevens Pass highway. On private land the usual cutting practice is to remove all the merchantable pine timber; however, the pine stands in this county often contain a considerable number of young "bull pine" trees and the stand left after logging frequent exceeds 1,000 board feet per acre. Horses and tractors are used for skidding, while motor trucks are used in transporting the logs to the sawmill. Logs are trucked relatively long distances, sometimes nearly 50 miles. The topography is rough and the logging roads generally have heavy grades. All of the logs cut in this county are manufactured by local plants. The greater part of the logging is done on a contract

basis, although some concerns obtain part of their log supply by contract and part by company logging.

There is a strong demand for fuel wood, both in the towns and among the rural population. This enables limbwood, dead timber, cull trees, and material that would otherwise be left in the woods after logging to be utilized as fuel. Utilization of this character was particularly noticeable in the Wenatchee Valley.

Wood-Using Industries

Forest exploitation started in Chelan County many years ago and sawmilling is one of the oldest industries. The industry here is characterized by stationary mills cutting 80 M board feet or less per 8-hour shift, and a box factory is normally operated in connection with the sawmill. The principal centers of lumber and box manufacture are Wenatchee, Cashmere, Peshastin, Ardenvoir, and Chelan, while there are several small mills at outlying points. The cut is very largely ponderosa pine most of which is sawn into plank, seasoned, and remanufactured into box shook. The boxes are used in shipping the fruit raised in the irrigated valleys.

According to the lumber census of 1934, there were 13 active sawmills in Chelan County and these cut 47,053 M board feet. The average annual lumber production from 1925 to 1934 inclusive was 45,784 M board feet and 91.6 percent of this was ponderosa pine, the remainder being almost entirely Douglas fir. By far the greater part of the lumber cut here is used locally; nevertheless, a few carloads of high grade ponderosa pine are annually shipped to midwestern points.

Several other kinds of forest products are manufactured here. There is a small shingle mill on Lake Wenatchee, the output of which is marketed within easy trucking distance, although sometimes outside of the county. At Ardenvoir, a small veneer lathe is operated in conjunction with the sawmill and the veneer, cut from ponderosa pine, is used in the fruit trade. Some of the mills also produce a small quantity of lath.

The Place of the Forests in the Everyday Life of the People

There are few places in which the forests have as far reaching effect upon the everyday life of the inhabitants as in Chelan County. The forests here are useful in three ways--as a source of raw material for wood products, as a conservator of the water that supplies the irrigated districts, and as a recreational asset.

The forests provide a source of raw material for the boxes in which the fruit raised here is shipped. It is estimated that about 55 million board feet of box shook are required annually to box the fruit crop packed in Chelan County. This box shook requires an even larger amount of lumber due to waste in manufacture. This figure exceeds the local cut of lumber, not all of which goes into boxes; however,

it is estimated that well over 75 percent of the lumber sawn in the county is used for box shook. This is an important industry and supplies a considerable number of workers with a part or all of their livelihood.

The forests help to beautify the scenic features and also have a beneficial influence upon wild life. They are relatively close to the densely populated fruit sections and offer temporary escape from the heat common to the lower elevations. Fishing and camping attract a considerable number of local people on week-ends throughout the summer season. The hunting is good and each autumn sportsmen come here from Seattle and Spokane. The recreational values are of considerable importance locally, since these are so situated as to enable wide use to be made of them.

The most important use of the rough mountainous areas in Chelan County is for watersheds that catch the precipitation and become a source for the streams which provide a water supply for the irrigated districts. The effectiveness of these watersheds depends partly upon the forest cover which breaks the force of the storms, provides a layer of humus that tends to check excessive runoff by absorbing large quantities of water and thus regulates stream flow, and prevents erosion. The bulk of the income for the county is from fruit crops grown upon the irrigated lands, hence is dependent upon the water supply of which there has never been an overabundance. In late years the situation has become a local problem and great consideration is being given to the proper use of the watersheds and the wisdom of maintaining the forest cover has been realized.

Summary

Chelan County exemplifies a rather unusual integration of the forests in the everyday economic life of the majority of those who dwell here. The forests are of paramount importance since the fruit industry is absolutely dependent upon the water coming from the forested slopes of the Cascade Range, while the timber milled here is largely used in boxing the crop for shipment. The recreational uses are also important because hunting, fishing, and camping attract a considerable number of people each season. If kept in a productive condition, protected from fire, and not over-cut the forests of this county should go a long way towards supplying the local needs for lumber and other forest products.

FOREST STATISTICS FOR CHELAN COUNTY, WASHINGTON
FROM INVENTORY PHASE OF FOREST SURVEY

TABLE 1. VOLUME OF TIMBER BY SPECIES AND OWNERSHIP CLASS
DATA CORRECTED TO JANUARY 1, 1936

TREES 12" AND MORE IN D.B.H.
THOUSANDS OF BOARD FEET, LOG SCALE, SCRIBNER RULE

SURVEY SYMBOL	SPECIES[1]	PRIVATE	STATE, AVAILABLE FOR CUTTING	COUNTY	INDIAN, TRIBAL AND TRUST ALLOTMENT	FEDERAL				TOTAL
						PUBLIC DOMAIN	RAILROAD SELECTION PENDING	NATIONAL FOREST AVAILABLE FOR CUTTING	NATIONAL FOREST RESERVED FROM CUTTING	
Y	PONDEROSA PINE	617,819	90,406	8,405	2,167	13,860	46,980	966,418	7,349	1,753,404
W	WESTERN WHITE PINE	6,967					18,340	118,579	17,123	161,009
LP	LODGEPOLE PINE	3,585	591	5		60	1,811	42,451	70	48,573
DF	DOUGLAS FIR	196,280	21,331	1,296	179	1,120	114,505	868,538	41,701	1,244,950
C	WESTERN RED CEDAR	13,279					16,977	77,885	8,939	117,080
YC	ALASKA CEDAR							417	161	578
H	WESTERN HEMLOCK	17,657					37,315	251,786	55,688	362,446
MH	MOUNTAIN HEMLOCK	9,037					67,915	115,066	30,655	222,673
WF	LOWLAND WHITE FIR	12,661	342				9,698	61,717	2,769	87,187
A	SILVER FIR	28,194					112,940	539,734	174,361	855,229
AF	ALPINE FIR	1,091	140					15,450		16,681
WL	WESTERN LARCH	24,443	4,960	80		130	11,930	35,999	25	77,567
ES	ENGELMANN SPRUCE	2,560					21,545	288,100	3,161	315,366
OM	BIGLEAF MAPLE	5						16		21
BC[2]	NORTHERN BLACK COTTONWOOD	7,916					745	10,848	770	20,279
ASP[2]	ASPEN	507								507
	TOTAL	942,001	117,770	9,786	2,346	15,170	460,701	3,393,004	342,772	5,283,550

1/ SPECIES NOT LISTED HERE WHICH OCCUR IN THE COUNTY, BUT IN NEGLIGIBLE QUANTITIES, ARE WHITEBARK PINE, ALPINE LARCH, AND ALDER.
2/ ADDITIONAL VOLUMES THAT WERE DETERMINED IN CORDS (A) ASPEN 172 CORDS (B) NORTHERN BLACK COTTONWOOD 200 CORDS.

FOREST STATISTICS FOR CHELAN COUNTY, WASHINGTON
FROM INVENTORY PHASE OF FOREST SURVEY

TABLE 2. AREA, IN ACRES, OF ALL FOREST COVER TYPES, BY OWNERSHIP CLASS
DATA CORRECTED TO JANUARY 1, 1936

SURVEY TYPE NO.	TYPE DEFINITION	PRIVATE	STATE, AVAILABLE FOR CUTTING	COUNTY	INDIAN TRIBAL AND TRUST ALLOTMENT	FEDERAL: PUBLIC DOMAIN	FEDERAL: RAILROAD SELECTION PENDING	FEDERAL: NATIONAL FOREST AVAILABLE FOR CUTTING	FEDERAL: NATIONAL FOREST RESERVED FROM CUTTING	TOTAL
	WOODLAND:									
5½	PONDEROSA PINE WOODLAND: SCATTERED STANDS OF MATURE PONDEROSA PINE ON UNFAVORABLE SITES	18,465	2,310	490	200	4,620		7,965		34,050
	PONDEROSA PINE: FORESTS CONTAINING 50% OR MORE OF PONDEROSA PINE									
20	PONDEROSA PINE, LARGE: FORESTS CONTAINING 50 TO 80% OF PONDEROSA PINE, MORE THAN 22" DBH	17,200	1,540			95	4,130	36,745	440	60,150
20.5	PURE PONDEROSA PINE, LARGE: FORESTS CONTAINING 80% OR MORE OF PONDEROSA PINE, MORE THAN 22" DBH	62,765	9,805	420	455	2,135	3,370	95,195	595	174,740
21	PONDEROSA PINE, SMALL: 12 TO 22" DBH	67,245	8,465	3,045	375	2,660	160	46,825	25	128,800
22	PONDEROSA PINE SEEDLINGS, SAPLINGS, AND POLES: LESS THAN 12" DBH	35,530	1,635	955	680	2,190	315	12,000	40	53,345
	PINE MIXTURE: MIXED FORESTS CONTAINING 20 TO 50% OF PONDEROSA PINE									
27	PINE MIXTURE, LARGE: 12" OR MORE DBH	9,155	200	5		160	110	18,765	940	29,335
28	PINE MIXTURE, SMALL: LESS THAN 12" DBH	1,160			195	25	390	3,620	20	5,410
	DOUGLAS FIR: FORESTS CONTAINING 60% OR MORE OF DOUGLAS FIR									
7	DOUGLAS FIR, SMALL OLD GROWTH: 22 TO 40" DBH	1,055					2,430	21,545	1,425	26,455
8	DOUGLAS FIR, LARGE SECOND GROWTH: 22 TO 40" DBH	1,445	370				2,215	12,870	220	17,120
9A	DOUGLAS FIR, LARGE POLES: 12 TO 20" DBH	1,680	205				420	16,570	160	19,035
9B	DOUGLAS FIR, SMALL POLES: 6 TO 10" DBH	3,435	210				365	16,125	40	20,175
10	DOUGLAS FIR, SEEDLINGS AND SAPLINGS: LESS THAN 6" DBH	2,590					1,780	8,410	890	13,670
	WESTERN RED CEDAR: FORESTS CONTAINING 40% OR MORE OF WESTERN RED CEDAR									
17	WESTERN RED CEDAR, LARGE: MORE THAN 24" DBH	810					125	1,130	210	2,275
	FIR-MOUNTAIN HEMLOCK: FORESTS CONTAINING 50% OR MORE OF SILVER FIR, ALPINE FIR, MOUNTAIN HEMLOCK, OR WESTERN HEMLOCK, OR ANY COMBINATION OF THESE SPECIES									
23	FIR-MOUNTAIN HEMLOCK, LARGE: 12" OR MORE DBH	2,585					9,865	43,125	11,955	67,530
24	FIR-MOUNTAIN HEMLOCK, SMALL: LESS THAN 12" DBH	740					2,140	10,980	2,050	15,910
	UPPER-SLOPE MIXTURE: MIXED FORESTS OF WESTERN LARCH, DOUGLAS FIR, ENGELMANN SPRUCE, SILVER FIR, WHITE FIR, ALPINE FIR, LODGEPOLE PINE, OR WHITE PINE; OCCASIONALLY OTHER SPECIES									
27½	UPPER-SLOPE MIXTURE, LARGE: 12" OR MORE DBH	5,095	805	20			4,675	42,415		53,010
28½	UPPER-SLOPE MIXTURE, SMALL: LESS THAN 12" DBH	2,305	860				1,690	40,755	610	46,220
	WHITE FIR: FORESTS CONTAINING 50% OR MORE OF WHITE FIR									
29	WHITE FIR, LARGE: 12" OR MORE DBH	40					190	315		545
	LODGEPOLE PINE: FORESTS CONTAINING 50% OR MORE OF LODGEPOLE PINE									
25	LODGEPOLE PINE, LARGE: 12" OR MORE DBH	285	70					4,460		4,815
26	LODGEPOLE PINE, MEDIUM: 6 TO 10" DBH	6,990	300				320	28,240	45	35,895
26A	LODGEPOLE PINE, SMALL: LESS THAN 6" DBH	2,625	170				970	35,665		39,430
	HARDWOOD: FORESTS CONTAINING 50% OR MORE OF ASPEN AND NORTHERN BLACK COTTONWOOD									
31.5	HARDWOODS, LARGE: 12" OR MORE DBH	405					25	585		1,015
31	HARDWOODS, SMALL: LESS THAN 12" DBH	1,260	10				75	125		1,470
33	SUBALPINE: FOREST AT UPPER LIMITS OF TREE GROWTH, USUALLY UNMERCHANTABLE	17,425	725				41,165	299,755	49,910	408,980
	NONRESTOCKED CUTOVERS: LOGGED AREAS NOT SATISFACTORILY RESTOCKED AND NOT CARRYING A RESIDUAL STAND OF 1 M OR MORE PER ACRE									
35A	CUT SINCE BEGINNING OF 1920						20	180		200
35B	CUT BEFORE 1920		110							110
	DEFORESTED AREAS: NONRESTOCKED AREAS DEFORESTED OTHERWISE THAN BY CUTTING									
37	DEFORESTED BURNS	2,695				30	2,595	7,155	195	12,670
38	NONCOMMERCIAL ROCKY AREAS	27,410	1,550	235	15	1,875	9,650	172,910	6,425	220,070
	TOTALS FOR FOREST LAND	292,395	29,340	5,170	1,920	13,790	89,190	984,430	76,195	1,492,430
1 & 2	NONFOREST LAND: CULTIVATED, GRASS, SAGEBRUSH, BARRENS, CITIES, UNMEANDERED WATER SURFACES, ETC.	216,310 ACRES OF NONFOREST LAND UNCLASSIFIED BY OWNERSHIP						119,930	27,330	363,570
	TOTALS FOR COUNTY							1,104,360	103,525	1/ 1,856,000

1/ THE TOTAL AREA OF THE COUNTY, ACCORDING TO THE BUREAU OF THE CENSUS, IS 1,856,000 ACRES. OF THIS TOTAL, 1,639,690 ACRES WAS CLASSIFIED AS TO OWNERSHIP BY THE FOREST SURVEY.

FOREST STATISTICS FOR CHELAN COUNTY, WASHINGTON
FROM INVENTORY PHASE OF FOREST SURVEY

TABLE 3. AREA, IN ACRES, OF GENERALIZED FOREST TYPES, BY OWNERSHIP CLASS
DATA CORRECTED TO JANUARY 1, 1936

TYPE DEFINITION		PRIVATE	STATE, AVAILABLE FOR CUTTING	COUNTY	INDIAN, TRIBAL AND TRUST ALLOTMENT	FEDERAL				
						PUBLIC DOMAIN	RAILROAD SELECTION PENDING	NATIONAL FOREST AVAILABLE FOR CUTTING	NATIONAL FOREST RESERVED FROM CUTTING	
HARDWOODS: COTTONWOOD AND ASPEN										
SURVEY TYPES 31, AND 31.5		1,665	10				100	710		2,485
PONDEROSA PINE 12" OR MORE DBH										
SURVEY TYPES 5½, 20.5, 20, 21, AND 27		174,830	22,320	3,960	1,030	9,670	7,770	205,495	2,000	427,075
PONDEROSA PINE LESS THAN 12" DBH	ON CUTOVER AREAS	32,585	1,615	785	875	1,485	290	10,375		48,010
SURVEY TYPES 22, AND 28	ON OLD BURNS	4,105	20	170		730	415	5,245	60	10,745
	TOTAL	36,690	1,635	955	875	2,215	705	15,620	60	58,755
CONIFERS 12" OR MORE DBH OTHER THAN PONDEROSA PINE AND LODGEPOLE PINE										
SURVEY TYPES 7, 8, 9A, 17, 23, 27½, AND 29		12,710	1,380	20			19,920	137,970	13,970	185,970
CONIFERS LESS THAN 12" DBH OTHER THAN PONDEROSA	ON CUTOVER AREAS	210						215		425
PINE AND LODGEPOLE PINE	ON OLD BURNS	8,860	1,070				5,975	76,055	3,590	95,550
SURVEY TYPES 9B, 10, 24, AND 28½	TOTAL	9,070	1,070				5,975	76,270	3,590	95,975
LODGEPOLE PINE 12" OR MORE DBH										
SURVEY TYPE 25		285	70					4,460		4,815
LODGEPOLE PINE LESS THAN 12" DBH										
SURVEY TYPES 26, AND 26A		9,615	470				1,290	63,905	45	75,325
NONCOMMERCIAL AREAS										
SURVEY TYPES 33, AND 38		44,835	2,275	235	15	1,875	50,815	472,665	56,335	629,050
NONRESTOCKED CUTOVER AREAS AND DEFORESTED BURNS										
SURVEY TYPES 35A, 35B, AND 37		2,695	110			30	2,615	7,335	195	12,980
TOTALS FOR FOREST LAND		292,395	29,340	5,170	1,920	13,790	89,190	984,430	76,195	1,492,430
NONFOREST LAND										
SURVEY TYPES 1 AND 2		216,310 ACRES OF NONFOREST LAND UNCLASSIFIED BY OWNERSHIP						119,930	27,330	363,570
TOTALS FOR COUNTY								1,104,360	103,525	1/ 1,856,000

1/ THE TOTAL AREA OF THE COUNTY, ACCORDING TO THE BUREAU OF THE CENSUS, IS 1,856,000 ACRES. OF THIS TOTAL, 1,639,690 ACRES WAS CLASSIFIED AS TO OWNERSHIP BY THE FOREST SURVEY

FOREST STATISTICS FOR CHELAN COUNTY, WASHINGTON
FROM INVENTORY PHASE OF FOREST SURVEY

TABLE 4. AREA OF FOREST LAND BY SITE QUALITY
DATA CORRECTED TO JANUARY 1, 1936

TYPE	SITE QUALITY CLASS[1]		AREA			
			ACRES	PERCENTAGE OF CONIFEROUS FOREST LAND CLASSIFIED AS TO SITE QUALITY	PERCENTAGE OF TOTAL FOREST LAND[2]	PERCENTAGE OF TOTAL AREA OF COUNTY
PONDEROSA PINE AND PONDEROSA PINE MIXTURE	PONDEROSA PINE	III	36,570	4.7	2.4	2.0
		IV	273,005	35.4	18.3	14.7
		V	172,545	22.4	11.6	9.3
		VI	4,970	0.6	0.3	0.3
			487,090	63.1	32.6	26.3
DOUGLAS FIR, FIR-MOUNTAIN HEMLOCK, AND UPPER-SLOPE MIXTURE	DOUGLAS FIR	IV	18,160	2.4	1.2	1.0
		V	266,225	34.5	17.9	14.3
			284,385	36.9	19.1	15.3
TOTAL			771,475	100.0	51.7	41.6
LODGEPOLE PINE[3]			81,390		5.5	4.4
NONCOMMERCIAL ROCKY AREAS			220,070		14.7	11.8
SUBALPINE[4]			417,010		27.9	22.5
HARDWOOD			2,485		0.2	0.1
TOTAL			720,955		48.3	38.8
GRAND TOTAL			1,492,430		100.0	80.4

1/ THE "SITE QUALITY" OF A FOREST AREA IS ITS RELATIVE PRODUCTIVE CAPACITY, DETERMINED BY CLIMATIC, SOIL, TOPOGRAPHIC, AND OTHER FACTORS. THE INDEX OF SITE QUALITY IS THE AVERAGE HEIGHT OF THE DOMINANT STAND AT THE AGE OF 100 YEARS. SIX SITE QUALITY CLASSES ARE RECOGNIZED FOR PONDEROSA PINE AND FIVE FOR DOUGLAS FIR, CLASS I BEING IN EACH CASE THE HIGHEST. IN THE SURVEY THE PONDEROSA PINE AND DOUGLAS FIR CLASSIFICATIONS, RESPECTIVELY, WERE USED NOT ONLY FOR TYPES OF WHICH THESE SPECIES ARE CHARACTERISTIC COMPONENTS BUT FOR OTHER TYPES FOR WHICH NO SITE QUALITY CLASSIFICATIONS HAVE BEEN DEVELOPED.

2/ THE TOTAL AREA OF THE COUNTY, ACCORDING TO THE BUREAU OF THE CENSUS, IS 1,856,000 ACRES. OF THIS TOTAL, ACCORDING TO FOREST SURVEY DATA, 1,492,430 ACRES (80.4 PERCENT) IS FOREST LAND AND 363,570 ACRES (19.6 PERCENT) IS NONFOREST LAND.

3/ THIS INCLUDES 1,250 ACRES OF TYPE 37 THAT OCCUR IN TYPE 26.

4/ THIS INCLUDES 8,030 ACRES OF TYPE 37 THAT OCCUR IN TYPE 33.

FOREST STATISTICS FOR CHELAN COUNTY, WASHINGTON

FROM INVENTORY PHASE OF FOREST SURVEY

FIGURE 2. DISTRIBUTION OF SAW-TIMBER VOLUME BY SPECIES AND OWNERSHIP CLASS (FROM TABLE 1)

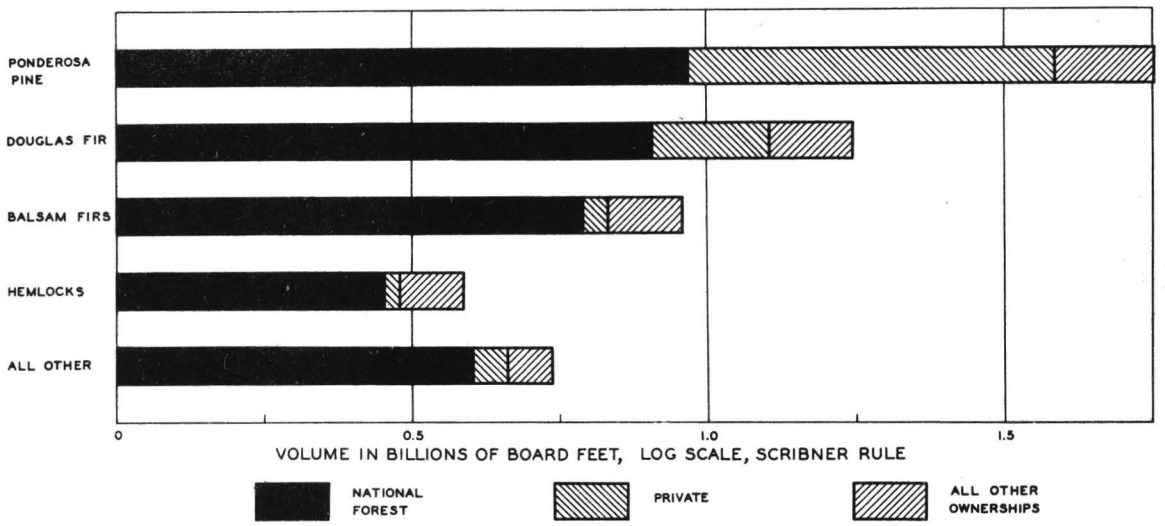

FIGURE 3. OWNERSHIP OF FOREST LAND (FROM TABLE 2)

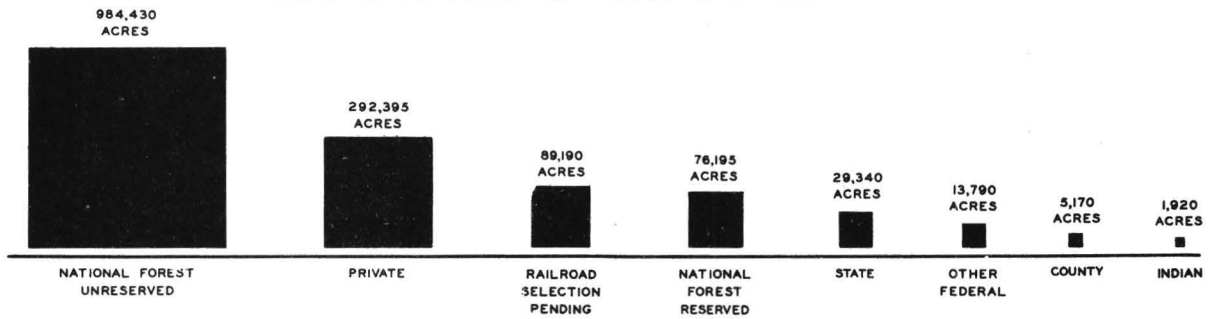

FIGURE 4. DISTRIBUTION OF FOREST LAND BY GENERALIZED TYPES, ALL OWNERSHIP CLASSES (FROM TABLE 3)